

1970

**OPERATING
SUMMARY**

FORT ERIE

water pollution control plant

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1970
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Division of Plant Operations

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Water management in Ontario

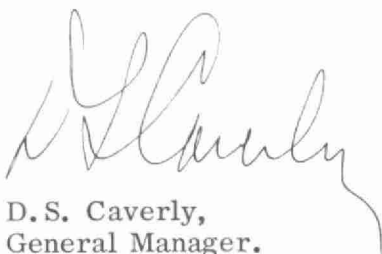
Ontario
Water Resources
Commission


135 St. Clair Ave. W.
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Ontario

Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.


D.S. Caverly,
General Manager.


D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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FORT ERIE

water pollution control plant

operated for

THE TOWN OF FORT ERIE

by the

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1970 ANNUAL OPERATING SUMMARY

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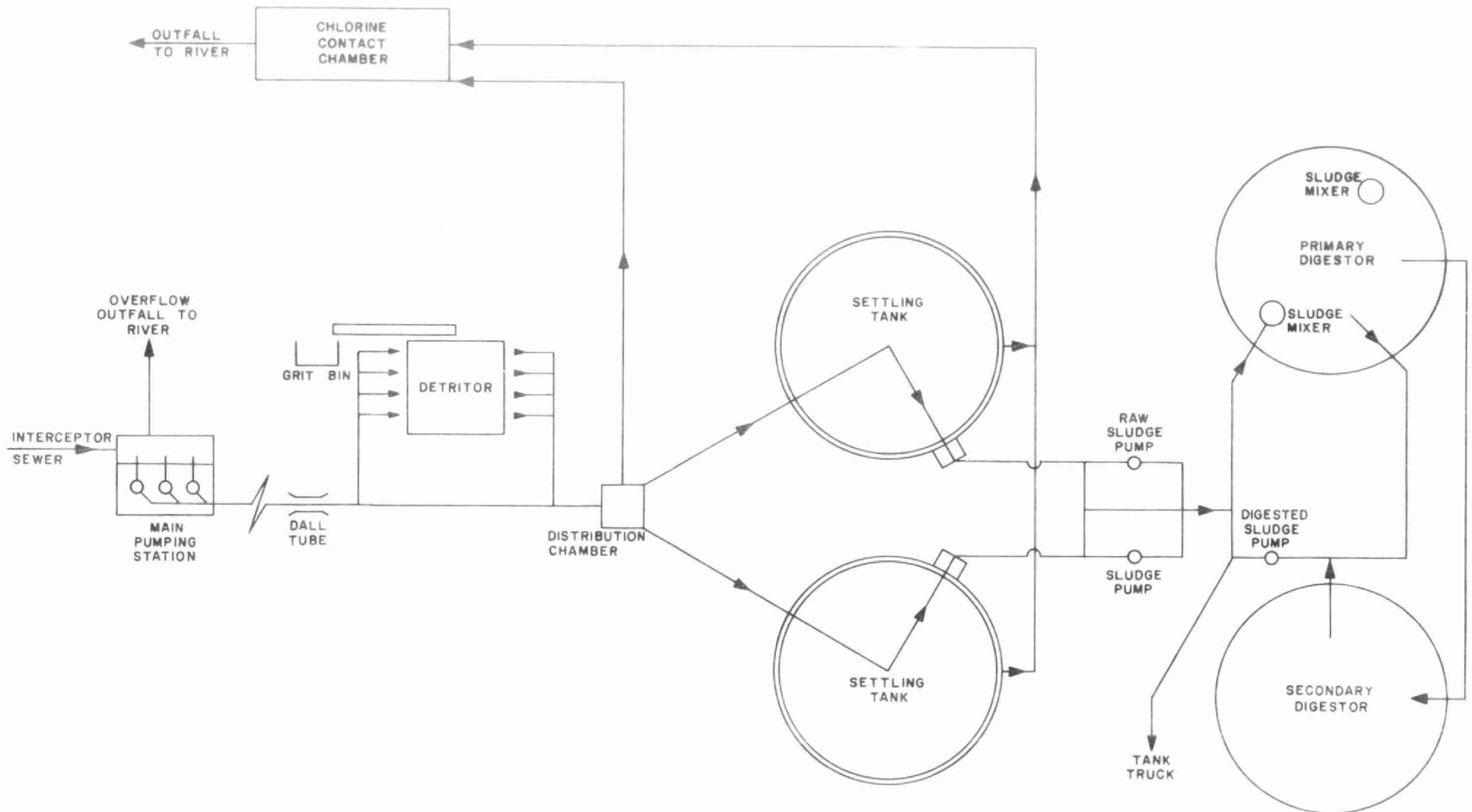
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Regional Supervisor
P. J. Osmond

Operations Engineer
J. Wesno

135 St. Clair Avenue West
Toronto 195

FORT ERIE SEWAGE TREATMENT PLANT
SIMPLIFIED FLOW CHART



DESIGN DATA

PROJECT NO.	2-0039-59	TREATMENT	Primary
DESIGN FLOW	1.8 mgd	DESIGN POPULATION	12,000
BOD - Raw Sewage	190 mg/l	SS - Raw Sewage	130 mg/l
- Removal	40%	- Removal	60%

MAIN PUMPING STATION

Type: Pulsometer Sterophagus pumps
(electric)

Size: Three 2060 gpm @ 32' tdh

PRIMARY TREATMENT

Screening

- Two coarse bar screens at
pumping station (2½" spacing)

Grit Removal

Type: Dorr Type WA Detritor

Size: One 12' x 12' x 1.61'
(232 cu ft or 1,445 gal)

Retention: 1.15 min

Primary Sedimentation

Type: Link Belt Type ADB-55

Size: Two 50' dia x 10' deep
(78,800 cu ft or 245,000 gal)

Retention: 3.27 hours

Loading: Surface, 458 gal/ft²/day
Weir, 5,720 gal/ft/day

CHLORINATION

Type: W & T A711 (automatic)

Size: One 2000 lb/day

Chlorine Contact Chamber

Size: 56.25' x 9.5' x 5' (2,680 cu ft or
16,700 gal)

Retention: 13.4 min

OUTFALL

1484' of 24" dia pipe to Niagara River

SLUDGE HANDLING

Digestion System

Type: Two-stage

Primary --

Type: Dorr draft tube mixers (2)
on fixed steel dome roof

Size: One 30' dia x 22' swd
(15,500 cu ft or 96,600 gal)

Loading: 2.70 lb/cu ft/mo

Secondary --

Type: Fixed steel dome roof

Size: One 30' dia x 21.5' swd
(15,200 cu ft or 94,600 gal)

Total Loading: 1.37 lb/cu ft/mo

'70 REVIEW

GENERAL

The primary and secondary digesters were cleaned out during the year. The thick scum layers which presented problems in previous cleanouts were adequately handled in the secondary digester using a high volume, low pressure air blower, however a fire hose hook-up arrangement was required in addition to the blower to break up the scum layer in the primary digester.

To prevent a recurrence of scum in the digesters, wire baskets were fabricated by plant staff and installed in the scum chambers to trap grease. The grease is then placed in plastic bags and removed from the plant to the garbage dump twice weekly.

The original metering (transmitter and receiver) instruments were replaced as they frequently broke down. Since the instruments were obsolescent, spare parts could not readily be obtained to carry out the repairs.

The Regional Municipality of Niagara assumed responsibility for the operation of this plant on December 1, 1970. The OWRC will continue to own this project and to bill the municipality for all costs with the exception of operating until the termination of the agreement.

EXPENDITURES

The operating costs for the Fort Erie plant were \$33,044.81 for the period from January to the end of November. The expenditures shown for December are costs incurred earlier by the OWRC-Municipal project only.

PLANT FLOWS and CHLORINATION

The total raw sewage flow to the plant was 637.1 million gallons representing an increase of approximately seven percent over 1969 and 20% over 1968 flows. The average daily flow increased from 1.63 million gallons in 1969 to 1.75 in 1970. This flow was equal to 97% of the plant's design flow of 1.8 mgd.

The Town of Fort Erie is aware of the hydraulic conditions at this plant and have been requested on many occasions during the past five years to implement storm and sanitary sewer separation programs.

The final effluent is chlorinated from May 14 to November 23 of each year. Influent chlorination is practiced year-round to eliminate odours in the detritor room of the plant. An effluent chlorine dosage of 3.2 mg/l was required to maintain a residual of 0.5 mg/l for 15 minute contact period.

FLOWS	DAILY FLOW mil gal	OCCURRING IN THE MONTH OF	MONTHLY FLOW mil gal	OCCURRING IN THE MONTH OF
Average	1.75	—	53.1	—
High	5.80	February	68.5	December
Low	.80	May	38.2	June

PLANT EFFICIENCY

The average raw sewage strengths for BOD and suspended solids were respectively 68 mg/l and 140 mg/l which are very similar to the strengths in the previous year. The BOD removal efficiency was similar to the efficiency in 1969 at 35%. An increase in suspended solids removal efficiency from 56% to 67% was obtained in 1970 over the previous year. The average effluent BOD of 44 mg/l and suspended solids of 46 mg/l were 2 mg/l and 6 mg/l less than in 1969. The total quantity of grit removed from the influent was unchanged from the previous year at 58 cubic feet.

SLUDGE DIGESTION and DISPOSAL

A total of 578,000 gallons of raw sludge with an average total solids concentration of 5.8% was digested. This represents an increase in volume of 19% over 1969 and 32% over 1968.

CONCLUSIONS

The hydraulic loading increased to approximately 97% of the design capacity in 1970. It is obvious no effective action to separate storm and sanitary sewers was taken during the year.

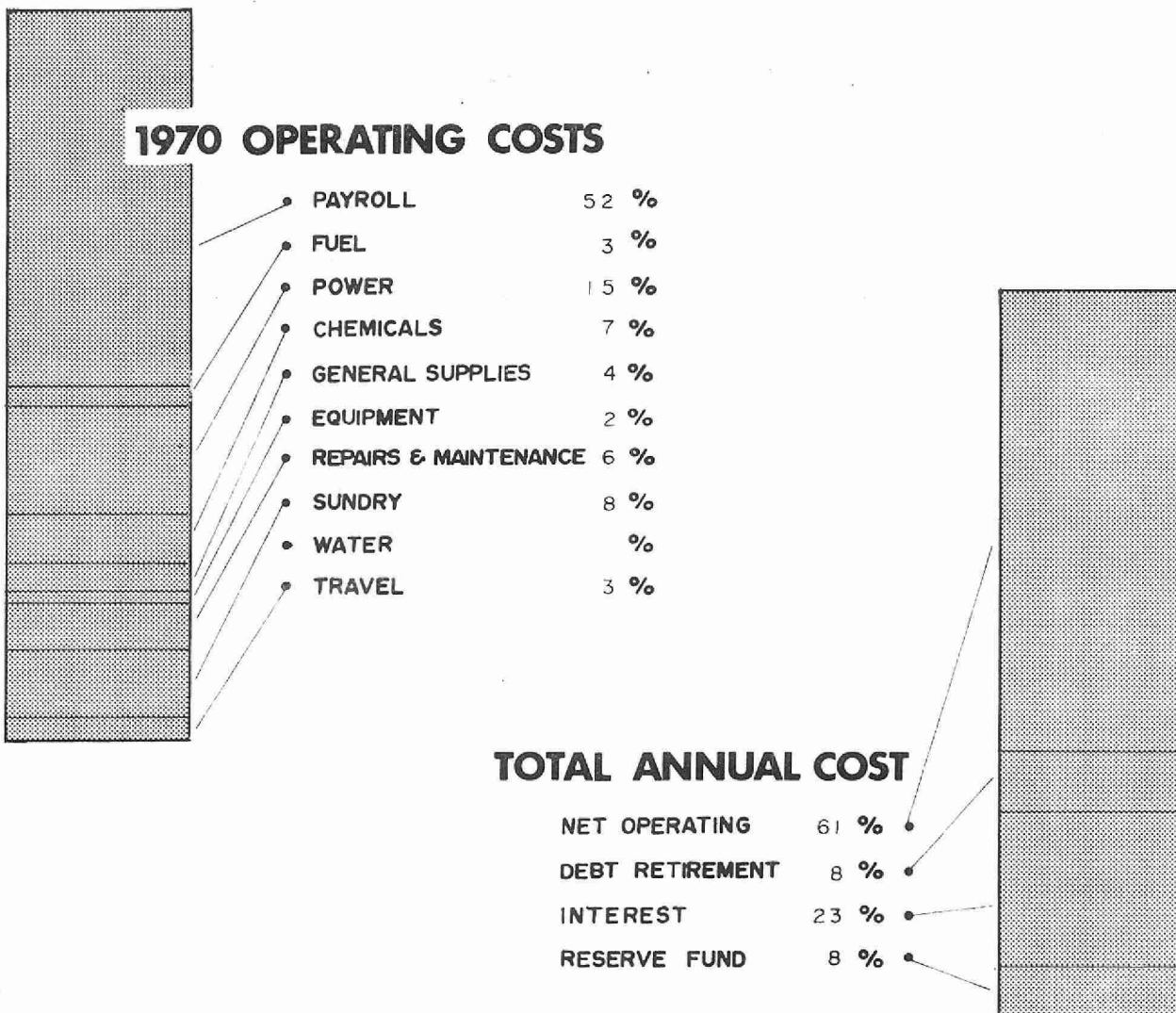
The primary and secondary digesters were successfully cleaned during the year. The provision of wire baskets in the scum chambers should prevent a recurrence of scum layer buildup in the digesters.

PROJECT COSTS

NET CAPITAL COST (Final)	\$807,050.52
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>590,794.31</u>
Long Term Debt to OWRC	<u>\$216,256.21</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	<u>\$ 41,388.71</u>
Net Operating	\$ 33,044.81
Debt Retirement	4,364.00
Reserve	4,190.96
Interest Charged	<u>12,116.02</u>
TOTAL	<u>\$ 53,715.79</u>

RESERVE ACCOUNT

Balance @ January 1, 1970	\$ 32,823.98
Deposited by Municipality	4,190.96
Interest Earned	<u>2,145.28</u>
	\$ 39,160.22
Less Expenditures	<u>3,396.57</u>
Balance @ December 31, 1970	<u>\$ 35,763.65</u>



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1966	603.50	\$26,123.29	\$43.29	19 cents
1967	620.69	27,797.55	44.78	15 cents
1968	527.08	33,844.08	64.21	16 cents
1969	596.06	34,664.71	58.16	23 cents
1970	638.75	33,044.81	51.87	22 cents

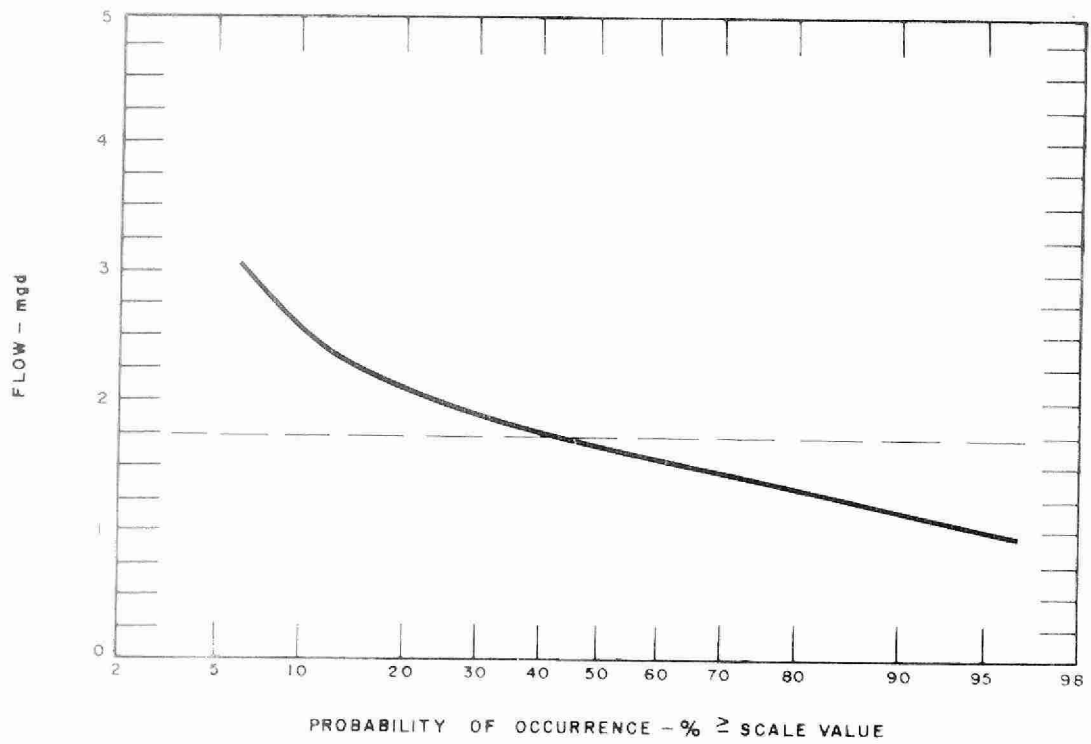
MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	TRAVEL	WATER
JAN	1987.60	1816.91	-	110.50	-	-	15.69	-	-	-	43.50	-
FEB	2235.02	1335.64	-	137.72	466.80	-	103.88	35.78	50.31	59.14	45.75	-
MAR	2081.69	1313.11	-	90.95	520.65	-	87.39	-	28.49	-	41.10	-
APR	2184.24	1283.47	-	95.18	519.78	-	93.45	19.99	55.50	59.87	57.00	-
MAY	2503.47	1421.05	-	70.38	494.70	-	118.12	-	101.17	252.00	46.05	-
JUNE	2733.80	1302.88	278.10	46.38	553.91	-	58.99	-	301.36	76.50	115.68	-
JULY	5917.06	1279.23	401.22	32.65	418.91	2318.40	163.01	235.78	125.55	735.16	207.15	-
AUG	3704.93	1868.83	471.51	53.98	434.21	-	47.23	-	128.57	636.40	64.20	-
SEPT	3247.86	1286.24	34.53	33.78	444.77	-	355.39	209.48	107.47	714.10	62.10	-
OCT	2425.82	1306.47	-	28.58	451.11	-	32.40	44.21	315.20	120.00	127.85	-
NOV	2259.72	1271.36	-	37.76	440.87	-	88.89	30.00	299.25	49.44	42.15	-
DEC	1763.60	440.06	-	115.59	468.93	-	177.24	24.85	397.73	72.30	66.90	-
TOTAL	33044.81	15926.25	1185.36	853.45	5214.64	2318.40	1341.68	600.09	1910.60	2774.91	919.43	-

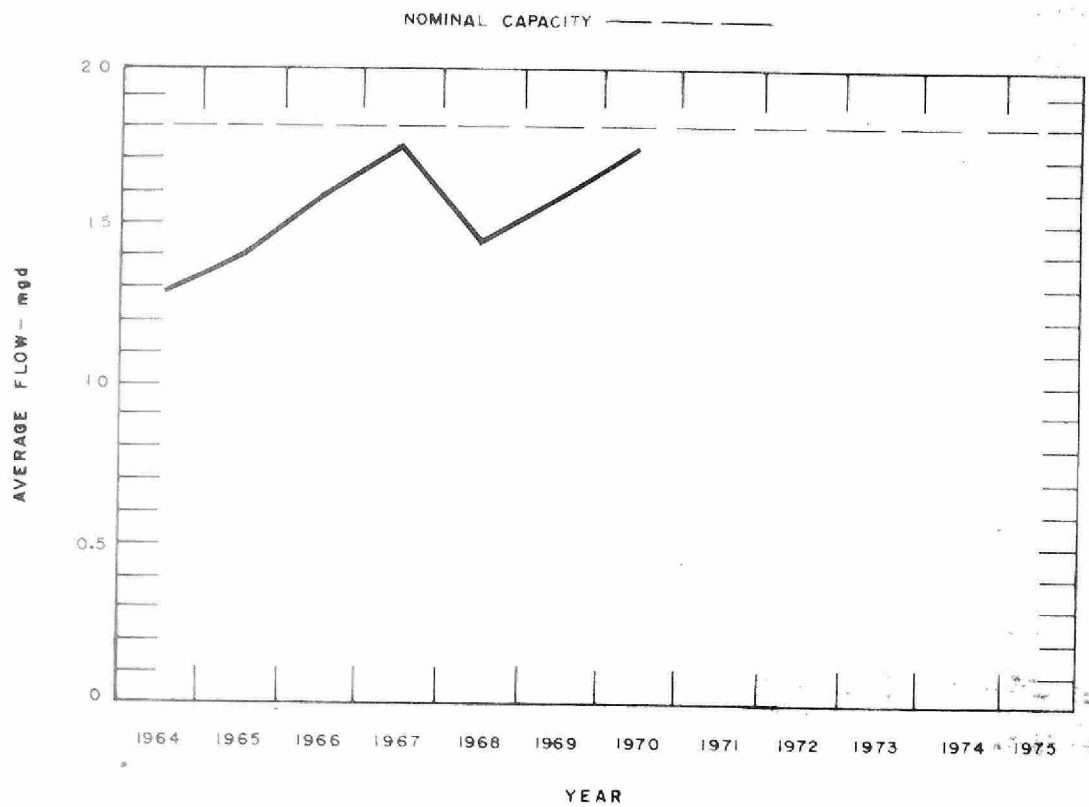
BRACKETS INDICATE CREDIT

* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$1,411.20

PROCESS DATA



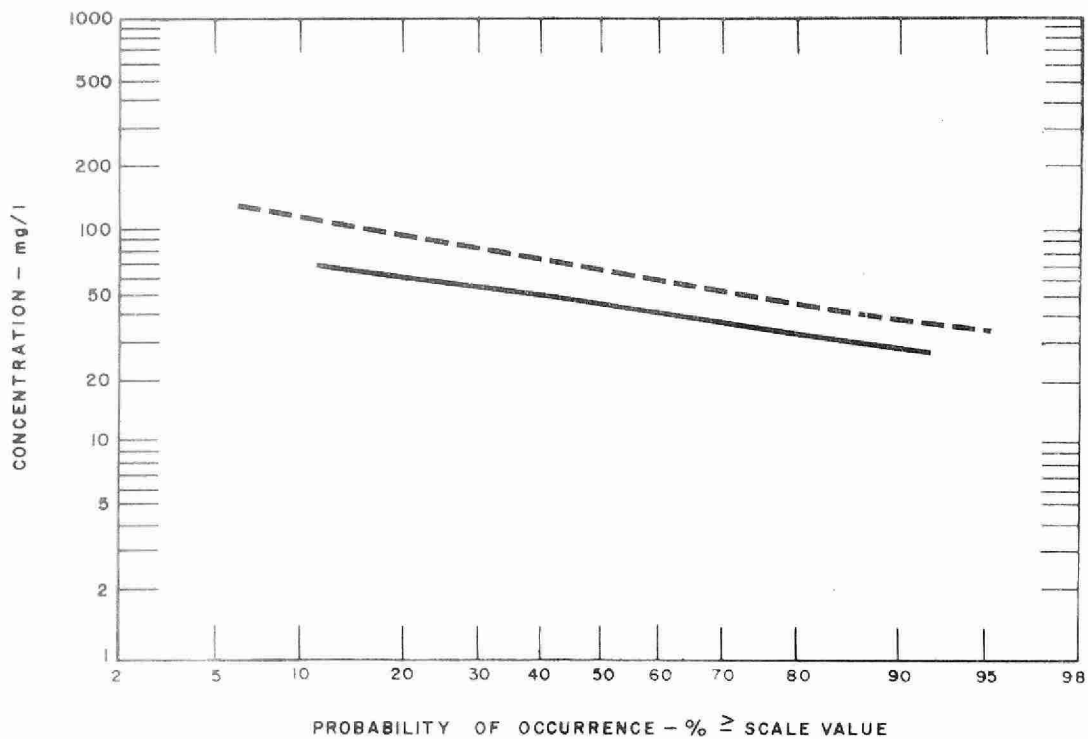
FLAWS



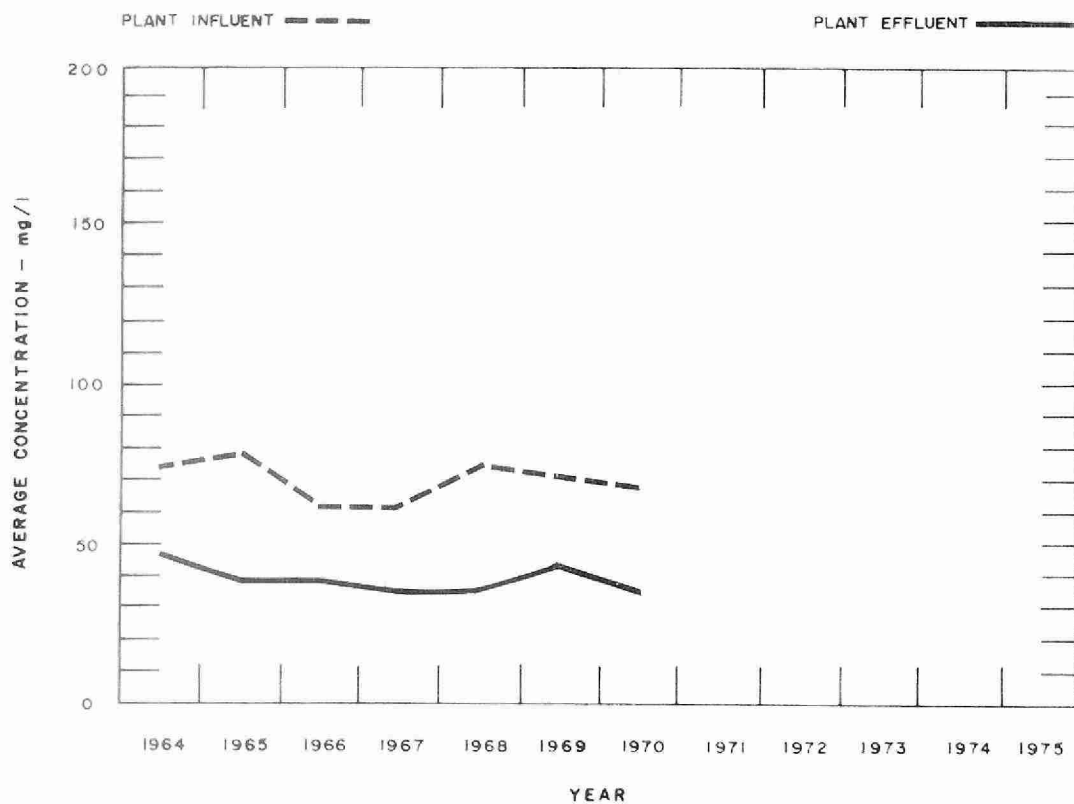
PLANT FLOWS and CHLORINATION

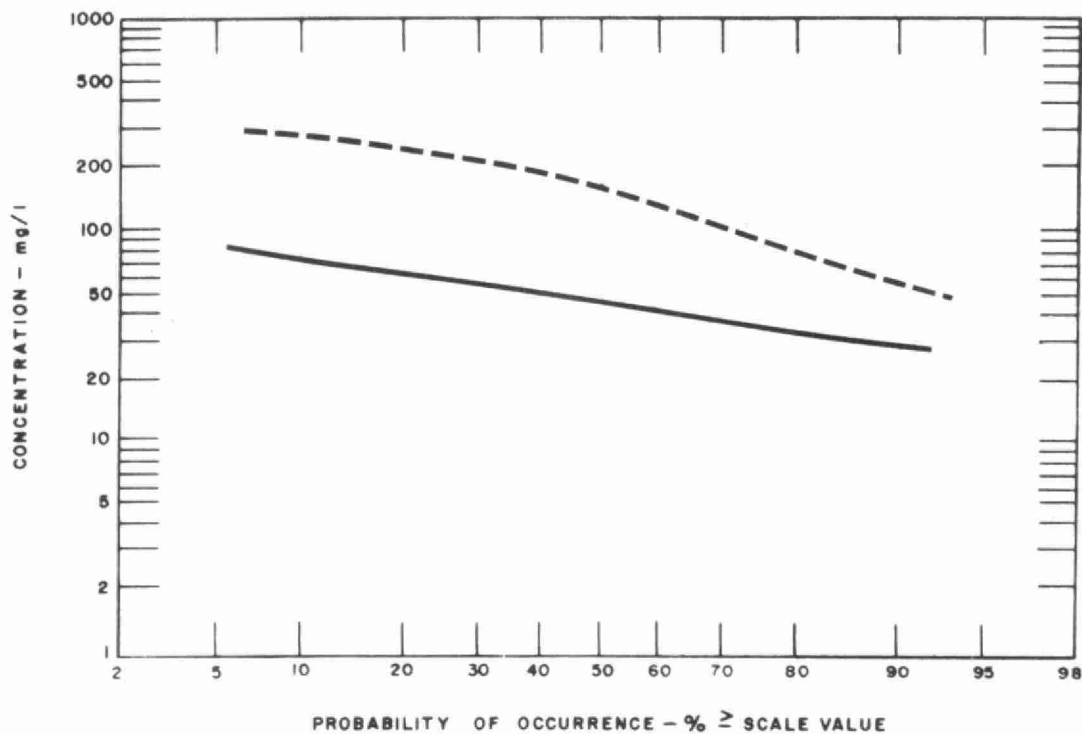
MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED 10 ³ pounds	DOSAGE mg/l
JAN	45.0	1.45	4.8	.9	.25	.6*
FEB	61.4	2.18	5.8	1.3	.25	.4*
MAR	68.4	2.20	4.8	1.2	.26	.4*
APR	43.5	.145	4.2	1.2	.22	.5*
MAY	46.9	1.51	3.1	.8	1.69	3.6
JUNE	38.2	1.27	2.3	1.0	3.12	8.2
JULY	49.5	1.60	4.1	1.0	3.16	6.4
AUG	50.7	1.63	3.0	1.1	3.36	6.6
SEPT	54.1	1.81	2.7	1.3	3.02	5.6
OCT	51.4	1.66	4.4	1.1	2.86	5.6
NOV	59.5	1.98	3.7	1.1	1.03	1.7*
DEC	68.5	2.21	4.9	1.5	.20	.6*
TOTAL	637.1	-	-	-	19.42	-
AVERAGE	-	1.75	-	-	1.62	3.2

* Used for odour control

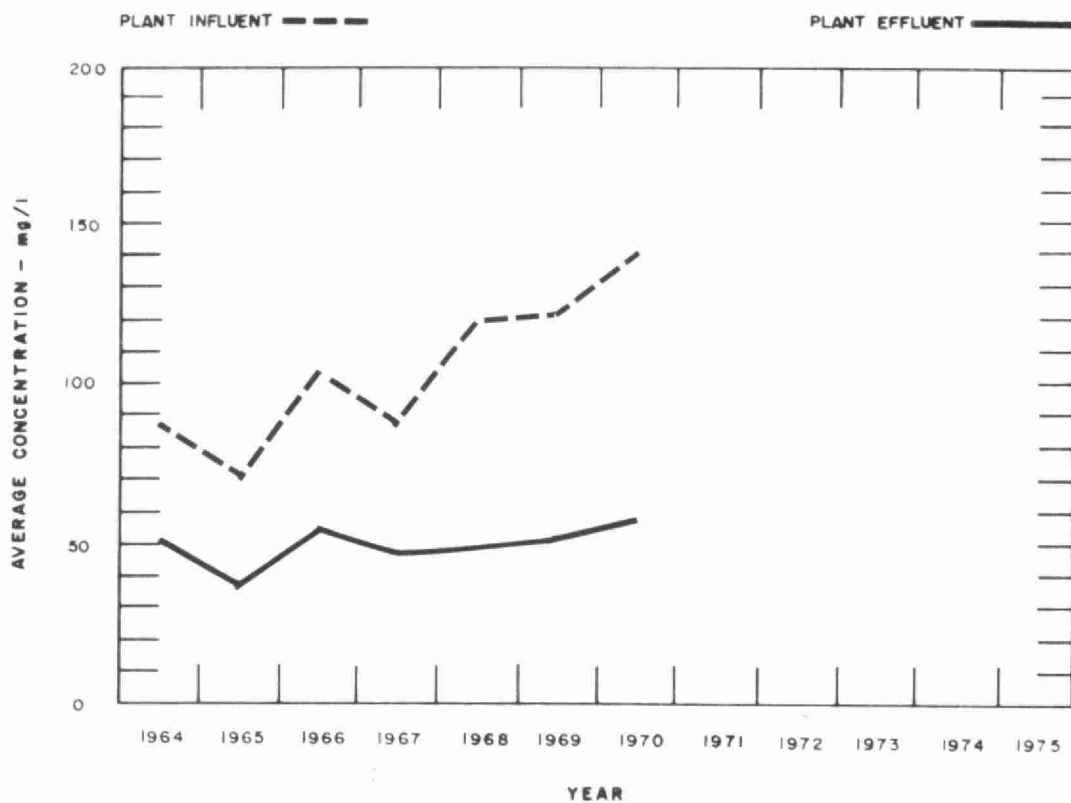


BIOCHEMICAL OXYGEN DEMAND





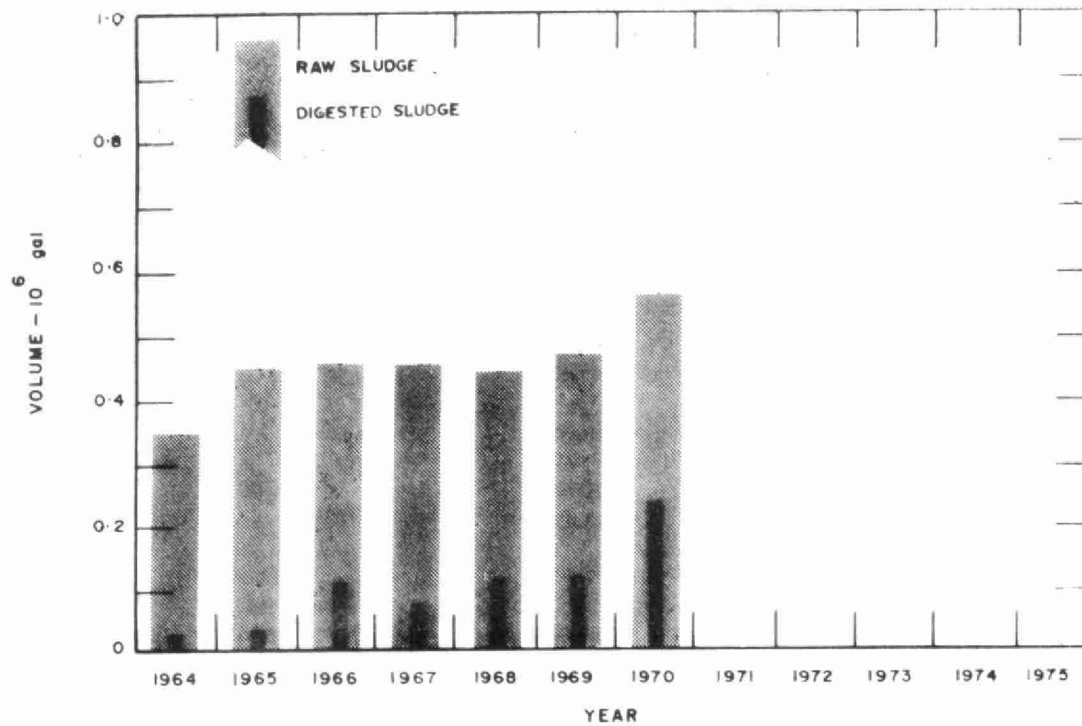
SUSPENDED SOLIDS



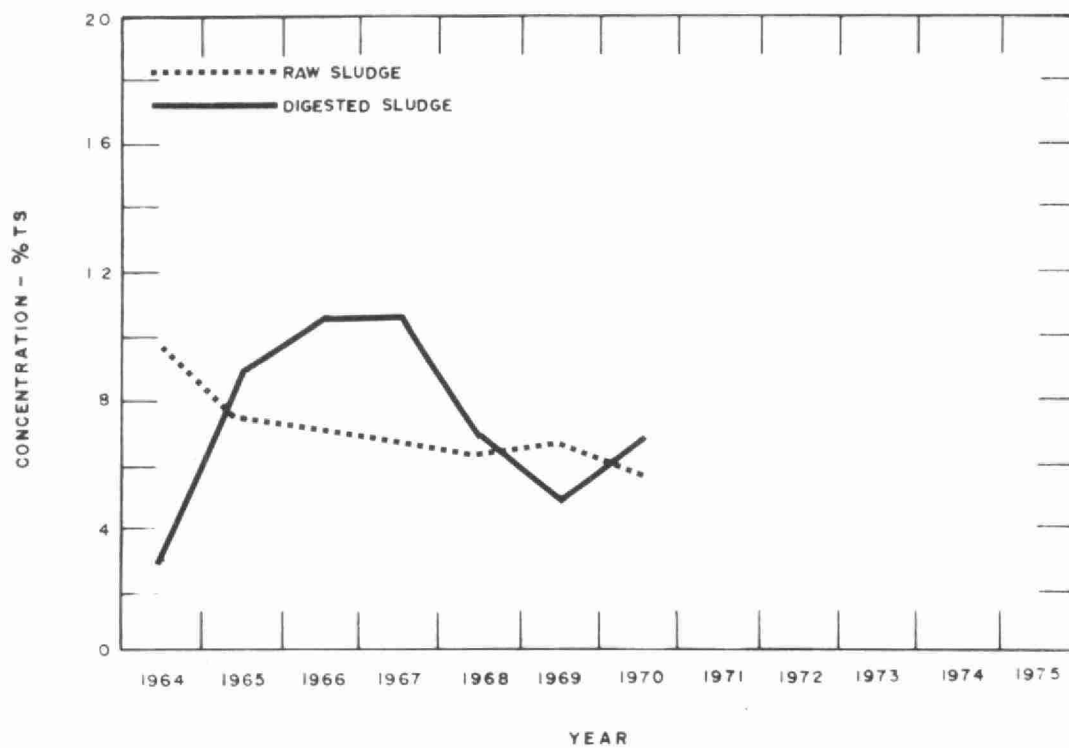
PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED cu ft
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	10 ³ pounds	n	mg/l	n	mg/l	%	10 ³ pounds	
JAN	2	75	2	46	39	13	4	272	4	68	75	92	5
FEB	2	40	2	25	38	9	5	119	5	58	51	38	6
MAR	2	36	2	31	14	3	6	130	6	51	76	54	3
APR	2	40	2	35	13	2	7	115	7	38	67	34	3
MAY	2	54	2	44	19	5	6	135	6	44	67	43	4
JUNE	2	80	2	55	31	10	5	137	5	43	69	36	4
JULY	2	67	2	48	28	9	3	134	3	39	71	47	5
AUG	2	118	2	39	67	40	4	107	4	42	61	33	6
SEPT	3	82	3	45	45	20	7	135	7	39	71	125	9
OCT	2	82	2	72	12	5	5	183	5	39	79	74	6
NOV	2	67	2	43	36	14	4	100	4	53	47	28	3
DEC	1	65	1	34	48	21	2	130	2	45	65	58	10
TOTAL	24	-	24	-	-	152	58	-	58	-	-	662	58
AVERAGE	-	68	-	35	35	13	-	140	-	56	67	56	5

NOTE - n is the number of samples taken



DIGESTION



SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	DEWATERED	LIQUID
	10 ³ gal	%	%	10 ³ gal	%	%	10 ³ gal	%	cu yd	cu yd
JAN	44	4.3	80	0	-	-	44	.3	-	0
FEB	41	5.9	79	0	-	-	41	.2	-	0
MAR	45	5.0	75	0	-	-	45	.2	-	0
APR	44	6.1	73	0	-	-	44	.2	-	0
MAY	45	6.4	69	42	6.4	50	17	.3	-	252
JUNE	42	5.5	70	98	6.8	52	34	.3	-	579
JULY	44	6.3	68	98	7.0	78	-	-	-	-
AUG	47	3.3	70	0	-	-	-	-	-	-
SEPT	50	9.0	62	0	-	-	19	.3	-	-
OCT	60	5.4	71	0	-	-	60	.3	-	-
NOV	57	7.8	67	0	-	-	57	.3	-	-
DEC	59	4.8	69	0	-	-	59	.3	-	-
TOTAL	578	-	-	238	-	-	420	-	-	1410
AVERAGE	48	5.8	71	-	6.7	60	42	.3	-	-

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